

WHAT IS CLAIMED IS:

1. A computer implemented method for receiving content data transmitted from a server in a sequence of packets, the server repeatedly transmitting the packets in sequence, the method comprising:

5           upon receipt of a first packet from the server, deriving from the packet a number of the packet in the sequence and a total number of packets in the sequence;

generating and storing an index having an entry for each of the packets in the sequence based upon the total number of packets in the sequence;

10           updating the index for each packet received subsequent to the first packet;

detecting based on the index whether any subsequent packet is missing from the sequence of packets; and

15           if a missing packet is detected, determining whether the first time required to retrieve the missing packet by waiting for the packet to be received in the repeating sequence is greater than a threshold time and, if the first time is greater than the threshold time, requesting the missing packet to be delivered from a server.

2. The method of claim 1, wherein updating the index comprises deriving the packet number from the subsequent packet in the sequence and updating the entry in the index corresponding to the derived packet number.

3. The method of claim 2, wherein detecting whether any subsequent packet is missing comprises comparing the packet number for a currently received subsequent packet to the packet number for the packet received immediately prior to the currently received packet to determine whether the currently received packet number follows consecutively in the sequence from the immediately prior packet number.

4. The method of claim 2, comprising detecting a second receipt of the first packet based on the index.
5. The method of claim 4, comprising stopping further receipts of packets in the sequence upon detection of the second receipt of the first packet.
- 5       6. The method of claim 4, wherein detecting whether any subsequent packet is missing comprises checking the index for any missing packet number following detection of the second receipt of the first packet.
7. The method of claim 1, wherein deriving the packet number and total number of packets comprises retrieving the packet number and total number from a header of the packet.
- 10     8. The method of claim 1, comprising estimating based upon the first packet a total data size for the packets in the sequence and allocating a storage buffer for the packets in the sequence at least as large as the total data size.
9. The method of claim 8, wherein estimating the total data size comprises determining the size of the first packet and multiplying the first packet size by the total number 15 of packets.
10. The method of claim 8, comprising storing content data in received packets in the allocated storage buffer in a sequence corresponding to the packet numbers.
11. The method of claim 1, wherein the threshold time comprises a time required to request and receive the missing packet from the server.
- 20     12. The method of claim 1, wherein determining whether the first time is greater than the threshold time comprises computing the first time based upon data representing available bandwidth.

13. The method of claim 1, wherein determining whether the first time is greater than the threshold time comprises computing the first time based upon measured time for receiving packets in the sequence.

14. The method of claim 1, comprising the client receiving packets by issuing a 5 subscription request to a multicast server.

15. A system for delivering content from a server to one or more clients, the system comprising:

a multicast server for transmitting an item of content in a sequence of packets,

each packet containing a header storing a number of the packet in the sequence, the packets being 10 transmitted as repeating loops of the packets in sequence;

a client system for subscribing to the multicast server, receiving the transmitted packets, tracking the receipt of packets using the packet numbers, identifying any packets in the sequence which are missing based on the tracked packet numbers, and deciding whether to wait for any given missing packet to be received in the subsequent loop or request the missing packet

15 from the server;

the multicast server transmitting the missing packet in response to a request received from the client system.

16. The system of claim 15, wherein the header for at least one packet contains data representing a total number of the packets in the sequence.

20 17. The system of claim 16, wherein the total number of packets is contained in the header for each packet in the sequence.

18. The system of claim 16, wherein the client system comprises a memory device storing an index of packet numbers, the index having a number of entries equal to the total number of packets in the sequence and being used by the client system in tracking .

19. The system of claim 16, wherein the client system comprises a memory device storing packets, the client system allocating space within the memory device for storage of the packets based on the total number of packets and a data size for at least one of the packets.

20. The system of claim 15, wherein the multicast server comprises a packetized data source structure for decomposing the content into the sequence of packets.

21. A computer readable medium storing program code for, when executed, 10 causing a computer to perform a method for receiving content data transmitted from a server in a sequence of packets, the server repeatedly transmitting the packets in sequence, the method comprising:

upon receipt of a first packet from the server, deriving from the packet a number of the packet in the sequence and a total number of packets in the sequence;

15 generating and storing an index having an entry for each of the packets in the sequence based upon the total number of packets in the sequence;

updating the index for each packet received subsequent to the first packet;

detecting based on the index whether any subsequent packet is missing from the sequence of packets; and

20 if a missing packet is detected, determining whether the first time required to retrieve the missing packet by waiting for the packet to be received in the repeating sequence is greater than a threshold time and, if the first time is greater than the threshold time, requesting the missing packet to be delivered from a server.

22. A computer implemented method for transmitting content data from a server to one or more clients, the method comprising:
- breaking the content data into a plurality of data packets arranged in a sequence;
- inserting into a header of each data packet a total number of packets in the sequence, a number of the particular packet in the sequence, and data representing a size of the data in the particular data packet;
- repeatedly transmitting the data packets in sequence; and
- upon request from a client for transmission of a given data packet, transmitting the given data packet in response to the request without waiting for the packet to appear in sequence.